Dissecting Aneurysm of the Vertebral Artery Developed after Microvascular Decompression for Hemifacial Spasm

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Summary

We report a rare case of a ruptured de novo dissecting aneurysm induced by ethyl 2-cyanoacrylate. A 39-year-old woman underwent microvascular decompression for left hemifacial spasm. The offending vessel was left posterior inferior cerebellar artery (PICA). Left vertebral artery (VA) was mobilized and affixed to the dura mater with cyanoacrylate to remove pressure of PICA to the root exit zone of the facial nerve. The left VA was found to be intact at the time of the operation.

One year later, the patient sufferd subarachnoid haemorrhage (SAH) caused by rupture of a newly-developed dissecting aneurysm of the left VA. Endovascular occlusion of the dissecting site was performed using Guglielmi detachable coils. We suppose mechanical injury and chemical reaction of ethyl 2-cyanoacrylate induced dissecting aneurysm.

Introduction

Although cyanoacrylate adhesives have been used in microvascular decompression for transposition of the offending vessel, several experimental and clinical studies reported vascular toxicity of these substances [1-4].

Here we report a case of SAH caused by rupture of de novo vertebral dissecting aneurysm possibly induced by ethyl 2-cyanoacrylate used in the preceding microvascular decompression one year before.

Case Report

A 39-year-old woman underwent microvascular decompression for left hemifacial spasm at another hospital. The offending vessel was left posterior inferior cerebellar artery (PICA). Left vertebral artery (VA) was mobilized and affixed to the dura mater with cyanoacrylate to remove pressure of PICA to the root exit zone of the facial nerve.

The left VA was found to be intact at the time of the operation. One year after the operation, she was referred to our hospital, complaining of occasional severe headache after hemodialysis. Magnetic resonance imaging (MRI) revealed enlargement of left VA. Angiography demonstrated a left VA dissecting aneurysm (figure 1). We had intended to perform endovascular occlusion of the aneurysm, but the day before the planned intervention, she experienced sudden headache and computed tomography revealed a diffuse SAH predominantly in the posterior fossa. We performed endovascular parent artery occlusion of the dissecting aneurysm using Guglielmi detachable coils (GDCs) (Target Therapeutics, Boston Scientific, Fremont, CA) (figure 2). The

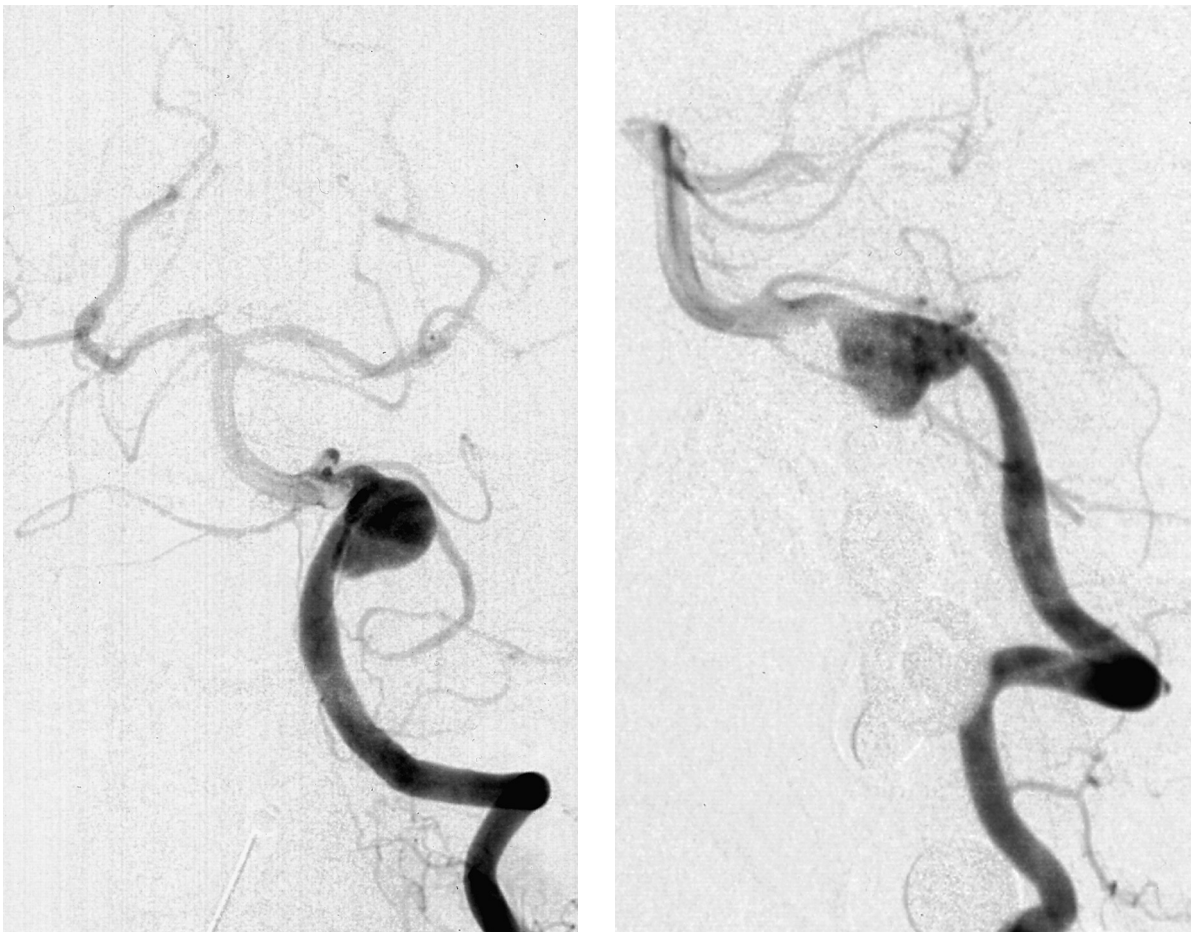

Figure 1 Left vertebral angiography showed dissecting aneurysm of the left vertebral artery.

patient's clinical condition gradually improved after treatment, and MRI revealed no procedure-related infarction. The patient's Glasgow Outcome Scale status was moderate disability at the time of discharge.

Discussion

Although cyanoacrylate adhesives have been used in microvascular decompression, several experimental studies reported vascular toxicity caused by these substances, especially methyl 2-cyanoacrylate [1-4]. Inflammatory reactions and acute tissue necrosis have also been reported for ethyl 2-cyanoacrylate, originally considered to be minimally toxic [1,2,5]. In fact, de novo VA dissecting aneurysms were reported to develop after microvascular decompression in which ethyl 2-cysnoacrylate was used [6,7].

Tokuda reported a case of a ruptured de novo aneurysm nine years after microvascular decompression in which ethyl 2-cyanoacrylate was used [7]. At the time of the operation, the aneurysm was firmly stuck to the dura mater of the pyramis by ethyl 2-cyanoacrylate. Since the developed aneurysm was located exactly at the point of the VA in which ethyl 2-cyanoacrylate was used at the previous operation, suggesting a causative role of adverse chemical reactions as well as mechanical stress in the development of the dissecting aneurysm.

Nakajima reported a fatal case of ruptured de novo dissecting VA aneurysm six years after microvascular decompression in which ethyl 2-cyanoacrylate was used [6]. The pathological examination revealed necrosis of the vascular wall with giant cell infiltration and destruction of the smooth muscle cell layer. This case had

underwent microvascular decompression twice before development of the aneurysm, suggesting the etiological role of minor trauma to the VA as reported previously [8].

Our case is unique in that the aneurysms was found to develop much earlier than the previous two cases. In any case, the lessons learned from these three cases were two fold. First, ethyl 2-cyanoacrylate should be avoided, if possible, for transposition of offending vessels in the microvascular decompression. Fibrin glue may be a preferred alternative. Second, follow-up magnetic resonance angiography (MRA) is recommended to rule out the development of the aneurysm, although the incidence of this sequela is unknown.

This is important in light of the fact that all of these cases reported so far suffered possibly fatal SAH.

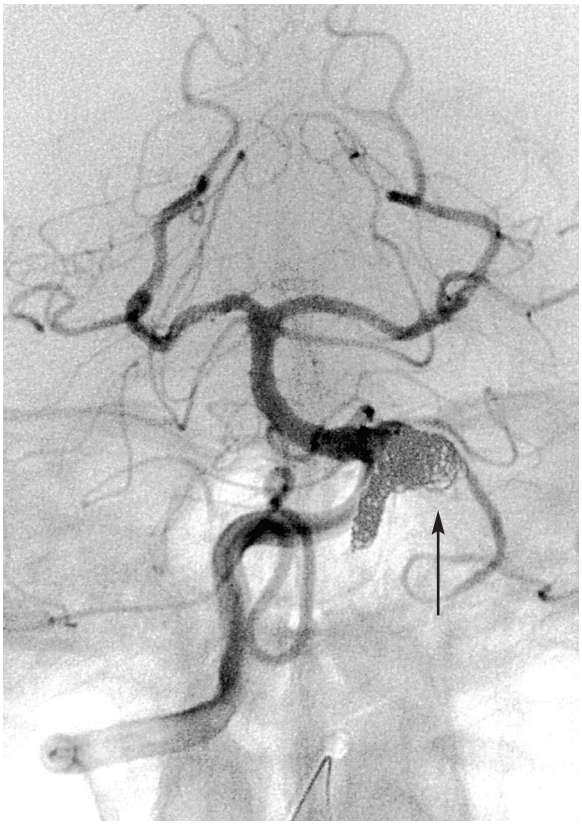

Figure 2 Postoperative angiography revealed complete obliteration of the dissecting aneurysm. Arrow: packed GDCs.

Refereces

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